Claims

1. An electrical circuit for a motor vehicle electrical distribution system, in particular for retaining the charge in a double-layer capacitor (5), having

- a first power supply (4),
- an electrical energy store (5) which consists of a plurality of storage elements (C2-C5) and which can be charged by the first power supply (2), and
- a charge-equalizing circuit (6) for charge equalizing between the individual storage elements (C2-C5) of the energy store (5), said charge-equalizing circuit (6) having a primary circuit and a plurality of secondary circuits,
- the primary circuit of the charge-equalizing circuit (6) having a primary winding (L1),
- while the secondary circuits of the charge-equalizing circuit (6) each have a secondary winding (L2-L5) and are in each case connected in parallel with the individual storage elements (C2-C5),

characterized in that

the charge-equalizing circuit (6) is connected by means of a first switching element (S5) to the first power supply (4) and by means of a second switching element (S4) to the energy store (5) in order as a function of the switching status of the switching elements (S4, S5) to effect charge equalizing and/or charge the energy store (5).

2. The electrical circuit as claimed in claim 1,

characterized in that

the charge-equalizing circuit (6) is additionally connected by means of a third switching element (S6) to a second power supply (2) in order to charge the energy store (5) optionally from the first power supply (4) or from the

second power supply (2).

3. The electrical circuit as claimed in claim 1 and/or claim 2, c h a r a c t e r i z e d b y a control unit (7) for driving the first switching element (S5) and/or the second switching element (S4) and/or the third switching element (S6)..

4. The electrical circuit as claimed in claim 3, c h a r a c t e r i z e d i n t h a t the control unit (7) is connected to a timer (14) in order to initialize recharging of the energy store (5).

5. The electrical circuit as claimed in claim 3 and/or claim 4, c h a r a c t e r i z e d i n t h a t the control unit (7) has a first comparator unit (12) for comparing the charging level of the energy store (5) with a predefined first minimum value ($U_{C,MIN}$) and/or with a predefined maximum value ($U_{C,MAX}$).

6. The electrical circuit as claimed in at least one of the claims 3 to 5, c h a r a c t e r i z e d i n t h a t the control unit (7) has a second comparator unit (10) which compares the voltage (U_{BAT12}) of the first power supply (4) with a second minimum value ($U_{BAT12,MIN}$) and will only switch the first switching element (S5) through if the second minimum value ($U_{BAT12,MIN}$) has been exceeded.

7. The electrical circuit as claimed in claim 6, c h a r a c t e r i z e d i n t h a t the control unit (7) has a third comparator unit (11) which

compares the voltage (U_{BAT36}) of the second power supply (2) with a third minimum value ($U_{BAT36,MIN}$) and will only switch the third switching element (S6) through if the third minimum value ($U_{BAT36,MIN}$) has been exceeded.

8. The electrical circuit as claimed in at least one of the preceding claims,
characterized in that
the first switching element (S5) and/or the second switching element (S4) and/or the third switching element (S6) is a relay or a semiconductor switch.

9. The electrical circuit as claimed in at least one of the preceding claims,
characterized in that
the first switching element (S5) and/or the second switching element (S4) and/or the third switching element (S6) is a transfer gate (15).

10. An operating method for an electrical circuit having an electrical energy store (5) consisting of a plurality of storage elements (C2-C5) and having a charge-equalizing circuit (6) for charge equalizing between the individual storage elements (C2-C5) of said energy store (5), said charge-equalizing circuit (6) having a primary circuit and a plurality of secondary circuits, the primary circuit of the charge-equalizing circuit (6) having a primary winding (L1), while the secondary circuits of the charge-equalizing circuit (6) each have a secondary winding (L2-L5) and are in each case connected in parallel with the individual storage elements (C2-C5),
comprising the following steps:
- charging of the energy store (5),
- charge equalizing between the individual storage elements

(C2-C5) of the energy store (5) by the charge-equalizing circuit (6),

characterized in that

the energy store (5) is charged by the charge-equalizing circuit (6).

11. The operating method as claimed in claim 10,

characterized in that

the charge-equalizing circuit (6) for charging the energy store (5) is connected to a first power supply (4) or a second power supply (2).

12. The operating method as claimed in claim 11,

characterized by the following steps:

- Measuring the output voltage (U_{BAT12}) of the first power supply (4)
- Comparing the measured output voltage (U_{BAT12}) with a first minimum value ($U_{BAT12,MIN}$)
- Connecting the charge-equalizing circuit (6) to the first power supply (4) only if the first minimum value ($U_{BAT12,MIN}$) has been exceeded.

13. The operating method as claimed in claim 12,

characterized by the following steps:

- Measuring the output voltage (U_{BAT36}) of a second power supply (2)
- Comparing the measured output voltage (U_{BAT36}) with a second minimum value ($U_{BAT36,MIN}$)
- Connecting the charge-equalizing circuit (6) to the second power supply (2) only if the second minimum value ($U_{BAT36,MIN}$) has been exceeded.

14. The operating method as claimed in at least one of the claims 10 to 13,

characterized in that
during normal operation the energy store (5) is connected to the first power supply (4) and/or the second power supply (2) and in the idle condition is split from the first power supply (4) and from the second power supply (2).

15. The operating method as claimed in at least one of the claims 10 to 14,
characterized in that
the charging level of the energy store (5) is checked in each case after a predefined period of time (T_{MAX}) has elapsed and the energy store (5) will be charged if a predefined third minimum value ($U_{C,MIN}$) has not been reached.

16. The operating method as claimed in at least one of the claims 10 to 15,
characterized in that
the energy store (5) is charged in each case up to a predefined maximum value ($U_{C,MAX}$).